

# **Blizzard Great Bend Kansas Project Description**

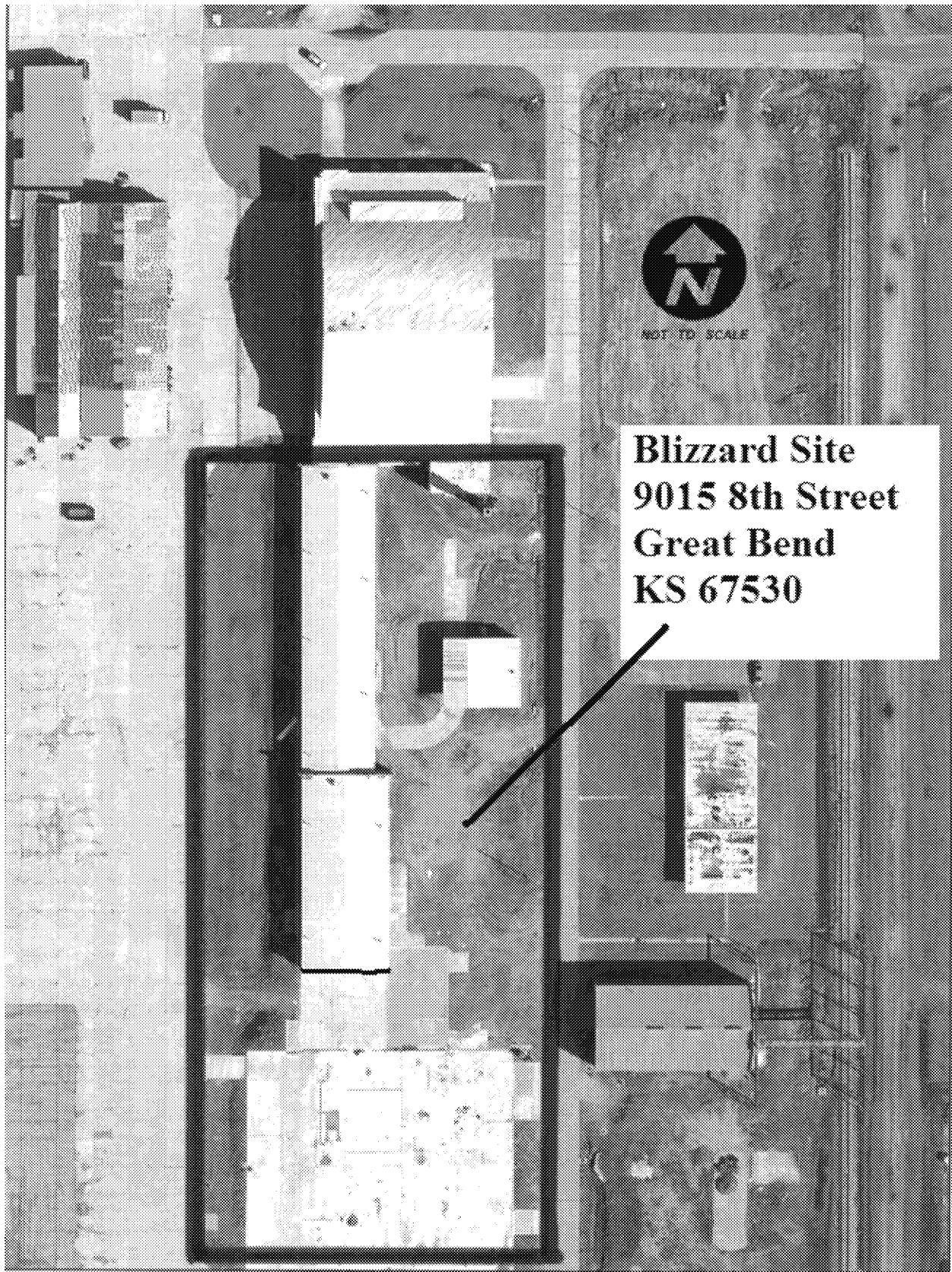
Blizzard Energy Inc. is a Kansas start-up company with an experienced management team, devoted to a sustainable, healthy environment and sound business practices. Blizzard's leased facility is located on a site about 3 miles south-west of Great Bend, KS in an industrial-zoned, unpopulated area, in close proximity to Great Bend Airport.

Site address: Westport Addition, 9015-H 8<sup>th</sup> Street, Great Bend KS 67530

Project Category:

**Waste to Energy and Materials Recovery**

Core technology: Low Temperature Pyrolysis



### 3 steel buildings and concrete pad



#### **Products:**

The project is based on the pyrolysis of scrap tires to recover pyrolysis oil, (similar in composition to heavy diesel) 35-40%, steel 10-15%, carbon black 35-40% and un-condensable synthetic gas (syngas) 10-15%.

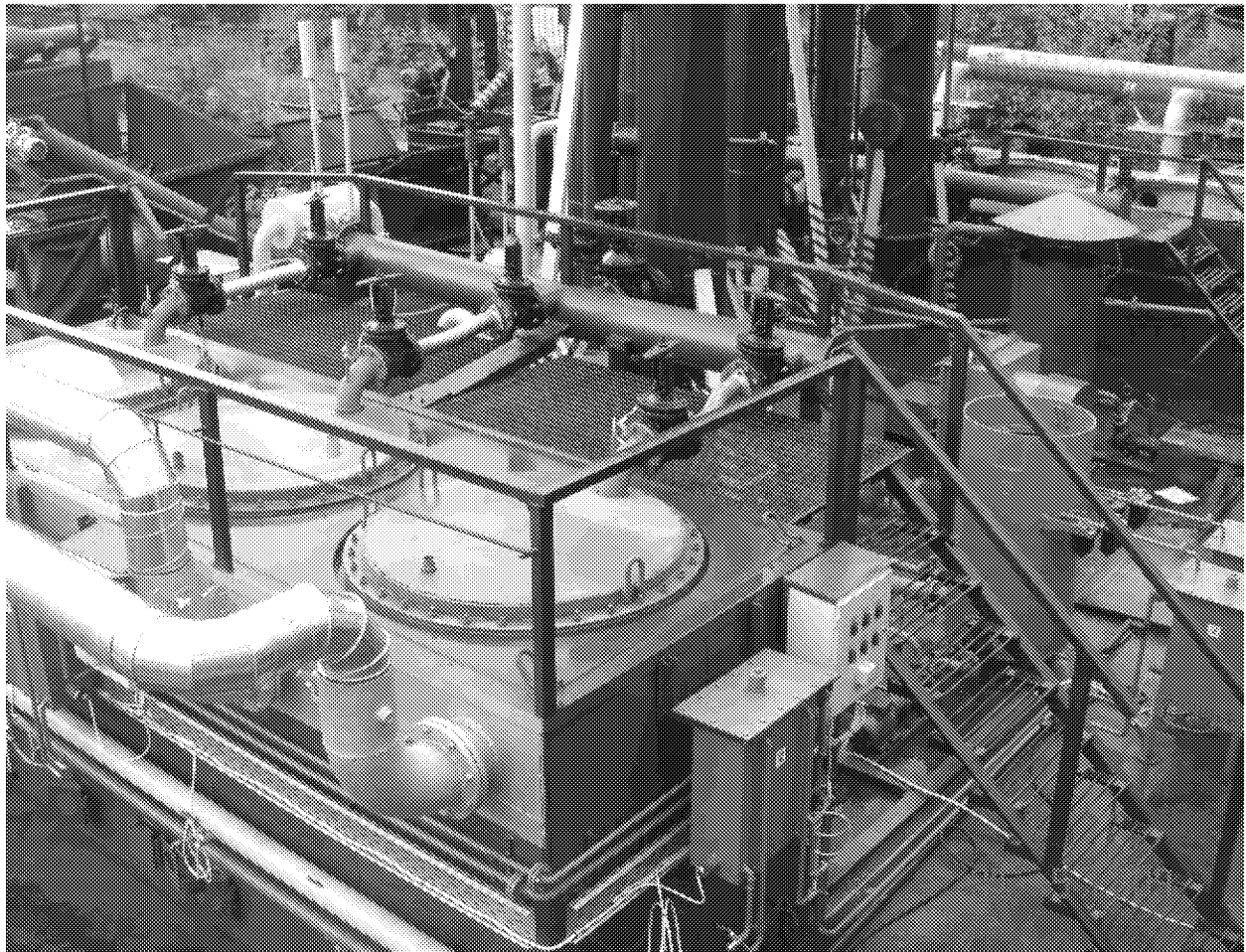
Pyrolysis oil will be processed into liquid fuels like heating oil and diesel and sold to the fuel industry, steel will be sold to the steel industry, carbon black will be sold to the rubber- and plastic- manufacturing- and other industries as a filler, the syngas will be recycled within the facility and used as the process energy source. The facility will process about 1 million tires per year.

### Technology Description:

Pyrolysis in general is the conversion, gasification and liquefaction of carbonaceous materials, in our case 'scrap tires' into its original constituents: oil, carbon and steel

Pyrolysis is a process of thermal decomposition in an oxygen-starved environment, in our case at temperatures of about 850-950 degrees F, in special enclosed reactor ovens. **The process itself has no air emissions, except for the burners providing the process heat to the ovens.**

Shredded tires are deposited into special reactor vessels, crucibles-like steel cylinders, 40 inches in diameter and 60 inches in height, holding about 800 pounds each, 3 crucibles are inserted into one oven, each oven has 3 chambers, one for each crucible, the oven is then closed and heated up.



One (of 4) oven with 3 green covers over the 'drop-in' crucibles

The decomposition- time per cycle is about 3-4 hours, during this time the primary gaseous product flows into a condenser - column, the condensate is raw pyrolysis oil. The oil is piped into an accumulator drum, then into larger holding tanks; the un-condensable gas is piped into a surge tank and then recycled to the burners, heating the ovens and the 'product stabilization equipment', see below.

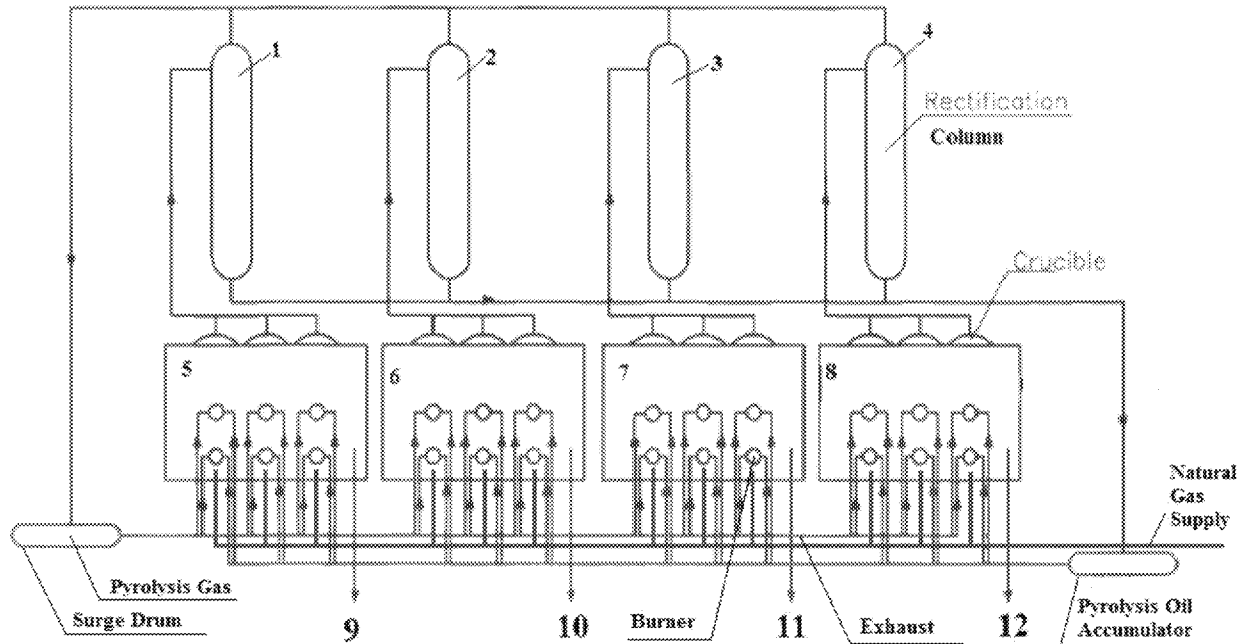
The remaining product in the crucible is the dry, raw carbon black, (looking like baseball-size raw coal) and steel wire (from the tire steel belt).

After the pyrolysis process has ended, meaning when all material in the crucibles has been decomposed, the crucibles are removed from the ovens and inserted into a vapor-type cooling system, for a period of about 3-4 hours.

The cooled carbon black and steel wire is dropped into a carbon black processing unit, where the steel is removed by magnets and the carbon black is milled into the micron-size final product and bagged into 10 to 50-pound vacuum bags for transport. This process is dust-controlled. The steel is collected in containers for transport.

**The pyrolysis part of the facility will consist of 4 ovens, each oven has 3 separate chambers, in each 1 crucible, each chamber has 2 burners for a total of 12 crucibles and 24 burners, see flow chart below:**

**Blizzard Pyrolysis Flow Chart**



1-4 Rectifying columns, 5-8 Pyrolysis Ovens (4), 9-12 Exhaust Flue Stacks (4). Each oven has 3 chambers with 1 crucible each chamber has 2 burners. The syngas is collected in a Gas Surge Drum, the pyrolysis oil produced and collected in an Oil Accumulation Vessel

**The 2-Chamber Stabilization Unit (2 units planned)**

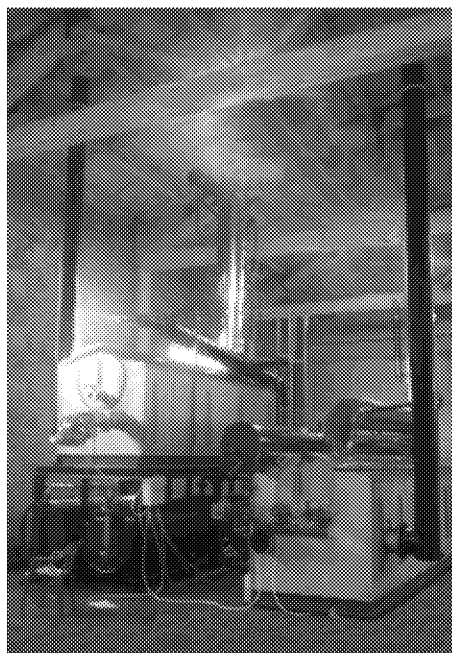
**sited outdoors**



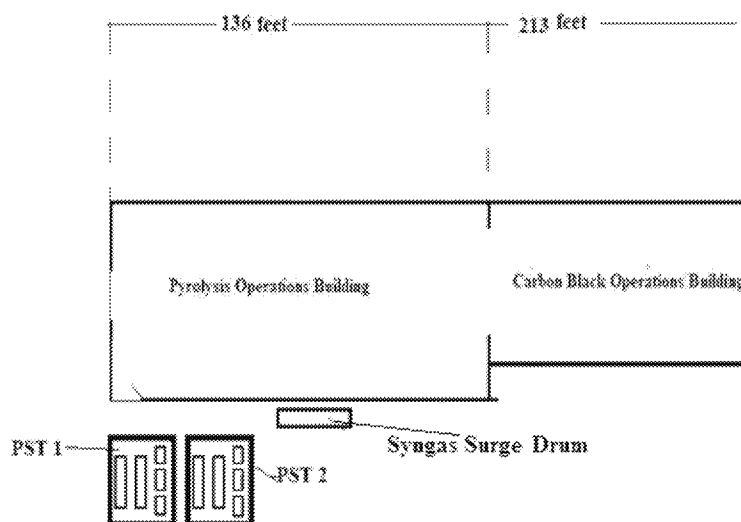


The raw pyrolysis oil is processed through the 'product-stabilizing system', which is located outside, next to the 'Pyro' building, on an existing concrete pad. The system consists of two primary processing units, each of a capacity of 400-600 barrels of oil per day as well as auxiliary equipment: mixers, pumps, etc.

**Each processing unit has 2 burners of combined 2.5 million BTU/hour, for a total of 4 burners and 5.0 million BTU/hour.**



### Product Stabilization Unit



The Product Stabilization consists of 2 identical units with 2 separate chambers each, each unit has 2 burners, 60 Ton per day through-put and 3 collection tanks each. Footprint is 25 x 15 feet each

There will be a series of tanks installed to hold the different intermediate products and the end products for sale, total capacity of tanks in full build-out is about 12,000 barrels= 500,000 gallons .

The tanks will have containment-berms as required by the code.

There is a filling station for tanker trucks for loading and piping will be installed for a rail-car loading system.

The facility will employ 25-30 full-time personnel; start-up is planned in spring/early summer 2013.

## Existing Buildings & Land

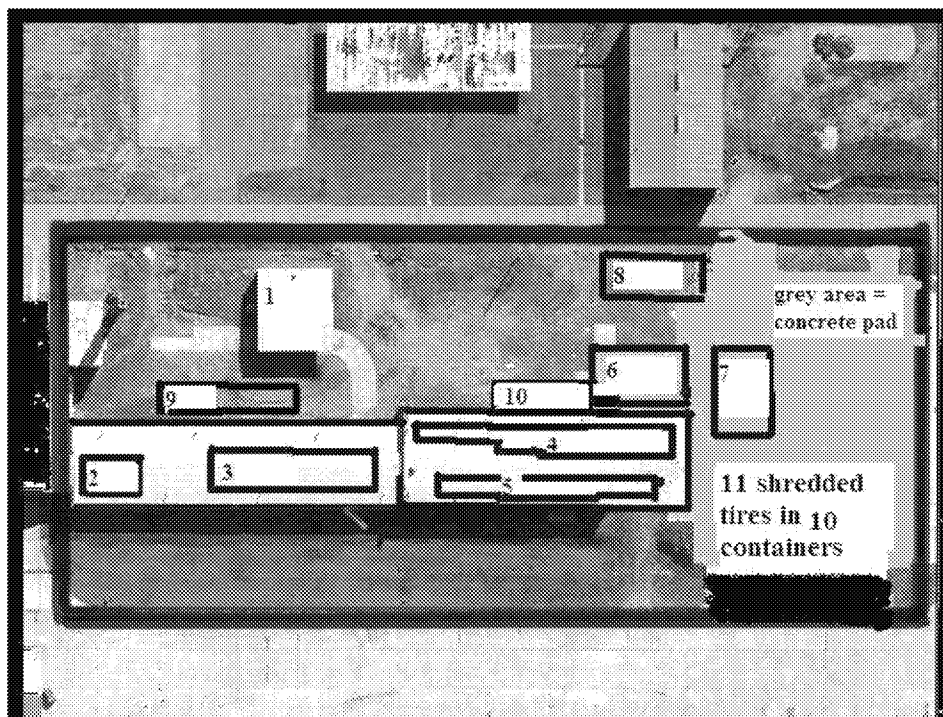
The facility consists of about 20,000 sq. feet in 3 buildings, a mobile office of 1,440 sq. feet, and about 1 acre of surrounding land, thereof about 30,000 sq. feet of concrete pads.

Access to the facility is via 8<sup>th</sup> Street, a paved road. The local terrain within the facility is flat. The entire facility is void of trees and vegetation, except for small grassy areas.

## Incoming Product & Storage:

Incoming shredded tires will be provided by truck by 'Resource Management Company Inc.' (RMCI), a permitted transporter and processor of waste tires; about 20 tons will be processed each day, about 60-100 tons reserves will be stored inside, in 3-4 containers in the southern "PYRO" building, about 200 tons will be stored outside in about 10 containers on the outside concrete pad. Incoming crude oil or other liquids for stabilizing and mixing will be stored in the tanks on the outside concrete pad.

## Storage Layout



- 1=general storage
- 2=carbon short term storage
- 3=carbon black operation
- 4=pyrolysis operation
- 5 shredded tires short term storage
- 6- product stabilization
- 7-tanks
- 8- tanker-truck filling station
- 9=office building
- 10= gas tank
- 11= shredded tires in 10 40-foot containers



**Transport of finished product:**

- a. Carbon Black, will be loaded into trucks and shipped to customers,
- b. transport fuel will be either filled into tanker trucks, or into rail cars, and then shipped to customers,
- c. scrap steel, will be loaded onto trucks and shipped to customers..

Liquids will be piped through above-ground and underground pipes to the holding tanks.

The syn-gas produced, and used in the process, will be piped into a surge drum for interim storage, additional natural gas needed for the process will be provided by Kansas Gas Service.